National Institute of Environmental Health Sciences

# Predicting impacts of climate change on Fasciola hepatica risk

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**Abstract:**

Fasciola hepatica (liver fluke) is a physically and economically devastating parasitic trematode whose rise in recent years has been attributed to climate change. Climate has an impact on the free-living stages of the parasite and its intermediate host Lymnaea truncatula, with the interactions between rainfall and temperature having the greatest influence on transmission efficacy. There have been a number of short term climate driven forecasts developed to predict the following season's infection risk, with the Ollerenshaw index being the most widely used. Through the synthesis of a modified Ollerenshaw index with the UKCP09 fine scale climate projection data we have developed long term seasonal risk forecasts up to 2070 at a 25 km square resolution. Additionally UKCIP gridded datasets at 5 km square resolution from 1970-2006 were used to highlight the climate-driven increase to date. The maps show unprecedented levels of future fasciolosis risk in parts of the UK, with risk of serious epidemics in Wales by 2050. The seasonal risk maps demonstrate the possible change in the timing of disease outbreaks due to increased risk from overwintering larvae. Despite an overall long term increase in all regions of the UK, spatio-temporal variation in risk levels is expected. Infection risk will reduce in some areas and fluctuate greatly in others with a predicted decrease in summer infection for parts of the UK due to restricted water availability. This forecast is the first approximation of the potential impacts of climate change on fasciolosis risk in the UK. It can be used as a basis for indicating where active disease surveillance should be targeted and where the development of improved mitigation or adaptation measures is likely to bring the greatest benefits.

**Source:** http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018428

## Resource Description

**Climate Scenario :**

specification of climate scenario (set of assumptions about future states related to climate)

Other Climate Scenario

**Other Climate Scenario:** SRES A1B

**Early Warning System:**

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

**Exposure :**

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature, Other Exposure

**Temperature:** Fluctuations

**Other Exposure:** cloud cover

**Geographic Feature:**

resource focuses on specific type of geography

None or Unspecified

**Geographic Location:**

resource focuses on specific location

Non-United States

**Non-United States:** Europe

**European Region/Country:** European Country

**Other European Country :** United Kingdom

**Health Impact:**

specification of health effect or disease related to climate change exposure

Infectious Disease

**Infectious Disease:** Foodborne/Waterborne Disease

**Foodborne/Waterborne Disease:** Fascioliasis

**Mitigation/Adaptation:**

mitigation or adaptation strategy is a focus of resource

Adaptation

**Model/Methodology:**

type of model used or methodology development is a focus of resource

Outcome Change Prediction

**Resource Type:**

format or standard characteristic of resource

Research Article

**Timescale:**

time period studied

Long-Term (>50 years)

**Vulnerability/Impact Assessment:**

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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